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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,641	01/21/2004	Jiemin Yang	TH2608 (US)	3328

23632 7590 08/03/2005

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EXAMINER	
NWAONICHA, CHUKWUMA O	
ART UNIT	**PAPER NUMBER**
1621	

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/761,641	YANG ET AL.	
	Examiner	Art Unit	
	Chukwuma O. Nwaonicha	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-79* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-79* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3/29/05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Current Status

Claims 1-79 are pending in the application.

Priority

Applicants' claim for domestic priority under 35 U.S.C. 119(e) is acknowledged.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulmer et al., {US 6,465,695} in view of Zakoshansky et al, {US 5,767,322}.

Applicants claim a process for oxidation of alkylbenzenes to produce hydroperoxides comprising: providing an oxidation feed consisting essentially of an organic phase, said oxidation feed comprising one or more alkylbenzenes and a

quantity of neutralizing base having a pH of from about 8 to about 12.5 in 1 to 10 wt. % aqueous solution, said quantity of neutralizing base being effective to neutralize at least a portion of acids formed during said oxidation, said oxidation feed comprising up to an amount of water effective to increase neutralization of acids formed during said oxidation without forming a separate aqueous phase; exposing said oxidation feed to oxidation conditions effective to produce an oxidation product stream comprising one or more product hydroperoxides; wherein all the other variables are as defined in the claim.

Determination of the scope and content of the prior art (M.P.E.P. §2141.01)

Fulmer et al. teach a method for manufacturing cumene hydroperoxide comprises reacting cumene and oxygen in the presence of a water phase comprising aqueous ammonia, and in the absence of an additive comprising an alkali or alkaline earth metal, to form cumene hydroperoxide. The system for producing cumene hydroperoxide comprises a cumene feed in fluid communication with a reactor having a cumene hydroperoxide oxidate outlet; an oxygen feed in fluid communication with the reactor; and an ammonia feed in fluid communication with the cumene feed and/or the reactor, wherein the cumene feed, the oxygen feed, the ammonia feed, and the reactor are free of an additive comprising an alkali or alkaline earth metal. The pH of the system ranges from 5-9. See detailed description of the invention on columns 3-5.

Ascertainment of the difference between the prior art and the claims (M.P.E.P.. §2141.02)

Fulmer et al. epoxidation process differs from the instantly claimed epoxidation process in that Fulmer et al. do not teach the process wherein alkali or alkaline earth metal is employed.

The secondary reference of Zakoshansky et al teach a greater efficiency in a water-alkaline emulsion cumene oxidation process using a cascade of reactors obtained by splitting the reactor cascade into 2 stages with the first stage utilizing NH_4NaCO_3 as the active carbonate in the stage containing less than 18% by weight cumene hydroperoxide and using Na_2CO_3 as the active carbonate in the stage containing more than 18% by weight cumene hydroperoxide. By directly injecting ammonia into a recycle stream organic acids are efficiently neutralized. A counter current water wash of the second stage also increases process efficiency by scrubbing out unwanted impurities. Control of pH in the process improves efficiency and reduces impurity levels. For the limitations not discussed above, see cumene oxidation process on columns 1-4.

Finding of prima facie obviousness--rational and motivation (M.P.E.P.. §2142-2143)

The instant claimed oxidation of alkylbenzenes to produce hydroperoxides comprising would therefore have been suggested to one of ordinary skill because one wishing to obtain alkylbenzene hydroperoxides is taught to select the processes of Fulmer et al. and Zakoshansky et al.

One of ordinary skill in the art would have a reasonable expectation of success in practicing the instant invention by varying the process conditions taught by Fulmer et al. and Zakoshansky et al. to arrive at the instantly claimed process for making

alkylbenzene hydroperoxides. Said person would have been motivated to practice the teaching of the reference cited because it demonstrate that alkylbenzene hydroperoxides can be prepared by the reaction of alkylbenzenes, neutralizing base and oxidizing agent to yield the desired product. Furthermore, the Examiner notes that Fulmer et al. and Zakoshansky et al. teach the reaction conditions and the quantity of the reactants, such as, the pH of the reaction medium, level of impurities including by-products such as acetophenone (AP), ethyl methyl benzyl from the group consisting of dimethylbenzyl alcohol (IDMBAI), and carbinol (EMBA), water content and the quantity of the neutralizing base can be varied by one of ordinary skill in the art for process optimization. Thus, the variation of the reaction conditions in the production of alkylbenzene hydroperoxides is not a patentable distinction because Fulmer et al. and Zakoshansky et al. teach the elements of the claimed invention with sufficient guidance, particularity, and with a reasonable expectation of success, that the invention would be *prima facie* obvious to one of ordinary skill in the art.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

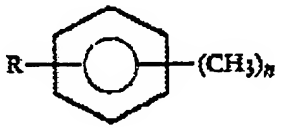
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colvin, {US 4,431,849}.

Applicants claim a process for oxidation of alkylbenzenes to produce hydroperoxides comprising: providing an oxidation feed consisting essentially of an organic phase, said oxidation feed comprising one or more alkylbenzenes and a quantity of neutralizing base having a pH of from about 8 to about 12.5 in 1 to 10 wt. % aqueous solution, said quantity of neutralizing base being effective to neutralize at least a portion of acids formed during said oxidation, said oxidation feed comprising up to an amount of water effective to increase neutralization of acids formed during said oxidation without forming a separate aqueous phase; exposing said oxidation feed to oxidation conditions effective to produce an oxidation product stream comprising one or more product hydroperoxides; wherein all the other variables are as defined in the claim.

Determination of the scope and content of the prior art (M.P.E.P. §2141.01)

Colvin teaches a process for preparing a methyl phenol from a tertiary hydroperoxide in an oxidation product of an alkylbenzene of the general structural formula 1



formula 1

wherein R is a secondary alkyl group and n is an integer of 1 to 3. The process comprises the reaction of alkylbenzenes, neutralizing base (ammonia, ammonia hydroxide, alkali metal hydroxide and alkali metal carbonate) and oxidizing agent to yield the desired product. The pH of the system ranges from 1-10. For the limitations not discussed above, see the background of the invention on columns 1-2, the description of the preferred embodiment on columns 2-3 and examples on columns 3-6.

Ascertainment of the difference between the prior art and the claims (M.P.E.P.. §2141.02)

Colvin oxidation process of alkylbenzenes to produce hydroperoxides differs from the instantly claimed oxidation process in that Colvin does not teach all the limitations of the reaction process, for example, adjusting the reaction condition in order to produce less by-products (impurities such as acetophenone (AP), ethyl methyl benzyl from the group consisting of dimethylbenzyl alcohol (IDMBAI), and carbinol (EMBA)).

Finding of prima facie obviousness--rational and motivation (M.P.E.P.. §2142-2143)

The instant claimed oxidation of alkylbenzenes to produce hydroperoxides comprising would therefore have been suggested to one of ordinary skill because one wishing to obtain alkylbenzene hydroperoxides is taught to select the process of Colvin.

One of ordinary skill in the art would have a reasonable expectation of success in practicing the instant invention by varying the process conditions taught by Colvin to arrive at the instantly claimed process for making alkylbenzene hydroperoxides. Said person would have been motivated to practice the teaching of the reference cited because it demonstrate that alkylbenzene hydroperoxides can be prepared by the reaction of alkylbenzenes, neutralizing base and oxidizing agent to yield the desired product. Furthermore, the Examiner notes that adjusting of the reaction conditions such as the pH of the reaction medium, level of impurities, water content and the quantity of the neutralizing base can be varied by one of ordinary skill in the art for process optimization. Thus, the variation of the reaction conditions in the production of alkylbenzene hydroperoxides is not a patentable distinction because Colvin teaches the elements of the claimed invention with sufficient guidance, particularity, and with a reasonable expectation of success, that the invention would be *prima facie* obvious to one of ordinary skill in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chukwuma O. Nwaonicha whose telephone number is

571-272-2908. The examiner can normally be reached on Monday thru Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chukwuma O. Nwaonicha, Ph.D.
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